ABSTRACT

An asymmetric network system manages bandwidth allocation and configuration of remote devices in a broadband network. A modular architecture of the system permits independent scalability of upstream and downstream capacity separately for each of the upstream and downstream physical paths. Allocation of downstream bandwidth to requesting devices is made according to bandwidth utilization by other devices, bandwidth demand by the requesting remote device, class or grade of service by the requesting remote device or bandwidth guaranteed to other remote devices. Configuration parameters remotely managed by the network include device addresses (global and local), transmission credit values, upstream channel assignment and upstream transmit power level. Further, management of device configuration profiles and bandwidth allocation occurs through control and response packets respectively generated by the network and the remote devices according to network operating software located at both ends. Control packets include poll packets that request, among other things, demand for an upstream transmission. Configuration packets instruct remote devices to assume an operational state or return status or statistical data. Response packets transmitted by the remote devices provide information to the network operations center for control purposes or to confirm the state of operation of remote devices, including channel operating statistics, errors, noise, etc. in order to remove or reallocate assigned upstream channels. Downloadable network operating software enables the network operator to upgrade remote operating software or to reconfigure the response profile of the remote devices. Account administration and usage reports are also generated. IP or ATM encapsulation, as well as forward error correction and encryption, are employed in the broadband network which may include an RF, satellite and cable medium with or without a telephony or router return path.